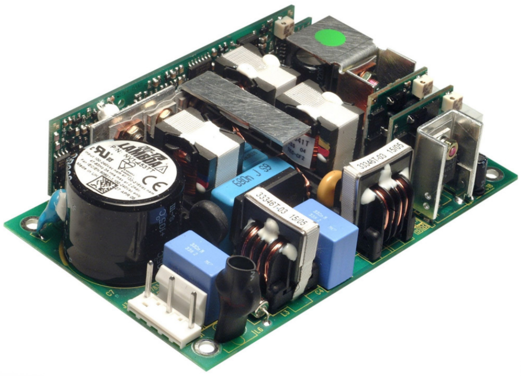
LAMBDA



- High Efficiency
- High Power Density (9.3W/in³)
- Up to 5 outputs
- No minimum load
- Fits 1U applications
- Medical Approval
- 3 Year Warranty

NV-Power

175/180/200 Watts, flexible power solution

Key Market Segments & Applications

Instrumentation
Medical
Automation
Security
Network Servers and Routers
Broadcast
ATE
Industrial Computing
Lifesciences/Laboratory

Features and Benefits

Feature	Benefit
◆ High Efficiency	◆ Minimises heat in system
◆ Low Profile	◆ Fits 1U applications
◆ High Power Density	◆ Less Space

INPUT

Input Voltage	90 - 264Vac
Input Frequency	47 - 63Hz (440Hz with reduced PFC - consult factory)
Input Harmonics	EN61000-3-2 compliant
Inrush Current	<40A at 25°C and 264Vac, (cold start)
Input Fuse	Fast acting (not user accessible)
Power Factor	0.97 typical
Earth Leakage Current	300µA max at 264Vac & 63Hz (normal condition, 500µA Single Fault Condition)

AVAILABLE OUTPUTS

Channel 1	Adjustment Range	Channel 2[1]	Adjustment Range	Channel 3	Adjustment Range	Channel 4[3]	Adjustment Range
5 5V / 25A[2]	5 - 5.5V	1 1.8V / 15A 2 2.7V / 15A 3 3.3V / 15A 0 Omit	0.9 - 3.3V 2.5 - 3.3V 2.5 - 3.3V	T 12V / 5A F 15V / 5A G 24V / 2.5A 0 Omit	12 - 15V 12 - 15V 18 - 24V	T -12V / 1A F -15V / 1A 3H -3.3V / 2A 5H -5V / 2A TH -12.1V / 2A FH -15V / 2A 0H Fan supply only 0 Omit	 Fixed Fixed Fixed Fixed Fixed Fixed
T 12V / 15A F 15V / 12A	12 - 15V[4] 12 - 15V[5]	5 5V / 10A 0 Omit	3.3 - 5.5V				
G 24V / 7.5A	24 - 28V[6]	5 5V / 8A 0 Omit	3.3 - 5.5V				

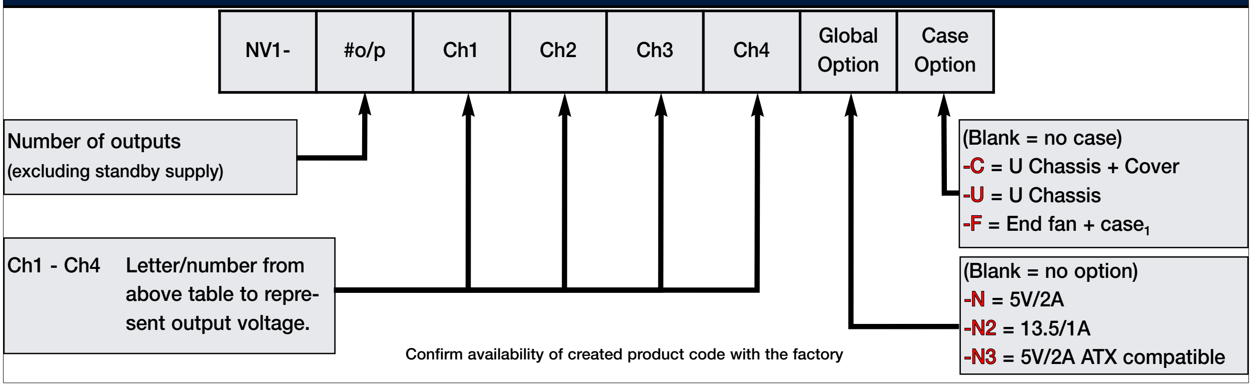
Notes:
1. 1.8V, 2.7V, 3.3V channel 2 only available with 5V Channel 1
   5V/10A channel 2 only available with 12V or 15V Channel 1
   5V/8A channel 2 only available with 24V Channel 1.
2. Maximum combined output current from Ch1 & Ch2 = 25A
   Models with 5V channel 1 are limited to 175W output power
3. Follow letters in red by 'P' for positive output channel 4.
4. 12 - 12.5V if 24V channel 3 fitted.
5. 14.5 - 15V if 24V channel 3 fitted.
6. 24 - 24.5V if 5V channel 2 fitted
   24 - 26V if 24V channel 3 fitted.

Other output options are available, please contact factory with your requirements.

OUTPUT SPECIFICATION

	Channel 1	Channel 2	Channel 3	Channel 4	Notes
Remote Sense	Yes		No		Max 0.5V total line drop
Total Regulation	1%				Including Line (for 90-264Vac input change), Load (for 0-100% load change) and Cross (for 0-100% load change on any other output) regulation
Ripple & Noise	maximum of 50mV or 1%				pk-pk, using EIAJ test method & 20MHz bandwidth
Voltage Accuracy	±1%			+4%/-3%	±4% for channel 4 with 'T' or 'F' type outputs
Turn on Time	1.5s max				at 90 Vac & 100% rated output power
Efficiency	up to 90%				configuration dependent
Hold up	16ms min				at 90 Vac
Minimum Load	None				on any output
Transient Response	<4%				of set voltage for 50% load change (in 50μs within the range 25 - 100% load)
Recovery	<500μs				for recovery to 1% of set voltage
Short circuit protection	Yes				
OverTemperature protection	Yes				
Over Voltage Protection	Yes				See Application Notes for details
Ch1 Good Signal	Yes				Provides a Logic 'Low' signal after output is within 90% (±5%) of nominal.
Peak Output Power	200W				Units with 12V, 15V or 24V (T, F or G) channel 1. Average output power must not exceed 180W over any 5 minute period.

HOW TO CREATE A PRODUCT CODE



1. Needs 0H, 3H, 5H, TH or FH type channel 4

QUICK SELECTOR - preferred configurations

Model	CH1	CH2	CH3	CH4	CH5	Global Option[1]
NV1-1T000	12V / 15A	-	-	-	-	No
NV1-1G000	24V / 7.5A	-	-	-	-	No
NV1-453TT	5V / 25A	3.3V / 15A	12V / 5A	-12V / 1A	-	No
NV1-453TT-N3	5V / 25A	3.3V / 15A	12V / 5A	-12V / 1A	5V / 2A	ATX (-N3)
NV1-453FF	5V / 25A	3.3V / 15A	15V / 5A	-15V / 1A	-	No
NV1-453FF-N3	5V / 25A	3.3V / 15A	15V / 5A	-15V / 1A	5V / 2A	ATX (-N3)
NV1-4G5TT	24V / 7.5A	5V / 8A	12V / 5A	-12V / 1A	-	No
NV1-4G5TT-N3	24V / 7.5A	5V / 8A	12V / 5A	-12V / 1A	5V / 2A	ATX (-N3)
NV1-4G5FF	24V / 7.5A	5V / 8A	15V / 5A	-15V / 1A	-	No
NV1-4G5FF-N3	24V / 7.5A	5V / 8A	15V / 5A	-15V / 1A	5V / 2A	ATX (-N3)

Above Units available on rapid delivery.
See over for additional variants available 'Build to Order'

1. see page 3 for details of global option

GLOBAL INTERFACE SIGNALS -N and -N2 Option Models	(see application note for details)
Remote on/off	TTL logic level high will inhibit all outputs (except Standby)
Power Good	Open collector output (referenced to PSU 0V)
Standby Supply	Isolated supply, not affected by remote on/off -N option = 5V / 2A (2.5A peak). -N2 Option = 13.5V / 1A

GLOBAL INTERFACE SIGNALS -N3 Option Models	(see application note for details)
ATX Remote on/off	TTL logic level high or open circuit will inhibit all outputs (except Standby)
ATX Power Good	Logic high indicates ac supply is good and output 1 is within regulation.
Standby Supply	5V / 2A (2.5A peak). Common 0V with power supply. Not affected by ATX remote on/off

ISOLATION		
Input to Output	Reinforced	4.3kV (dc)
Input to Earth	Basic	2.3 kV (dc)
Output to Earth		200 V (dc)

IMMUNITY EN61000-6-2:2001				Criteria
Electrostatic Discharge	EN61000-4-2	Level 3	Air discharge 8kV Contact discharge 4kV	A
Electromagnetic Field	EN61000-4-3	Level 3	(12V/m)	A
Fast / Burst Transient	EN61000-4-4	Level 4	(tested to 4.4kV)	A
Surge Immunity	EN61000-4-5	Level 3	Common mode to 2.2kV Differential mode to 1.1kV	A
Conducted RF Immunity	EN61000-4-6	Level 3	(12V)	A
Power Frequency Magnetic Field	EN61000-4-8	Level 4	(30A/m)	A
Voltage Dips, Variations, Interruptions	EN61000-4-11	Pass		

EMISSIONS EN61000-6-3:2001		
Radiated Electric Field	EN55022	(as per CISPR.22) Class A, Class B see application note for details
Conducted Emissions	EN55022	Class B (as per CISPR.22)
Conducted Harmonics	EN61000-3-2	Compliant
Flicker	EN61000-3-3	Compliant

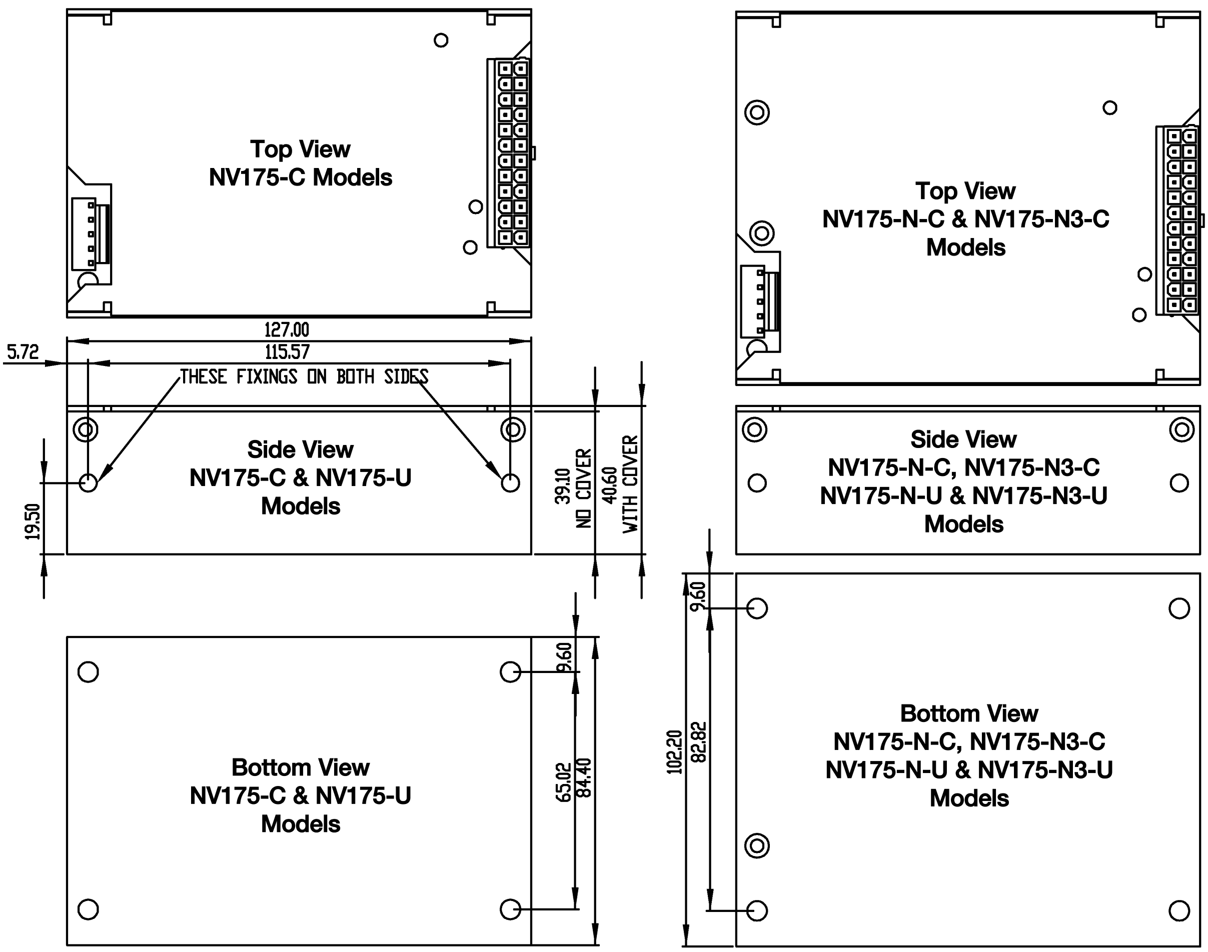
ENVIRONMENT	
Temperature	0 to 50°C operational, -40°C to 85°C storage (max 12 months) Full load with 2m/s air blown from input to output
Convection Rating	See Application note for details
Derating	50 to 70°C derate each output by 2.5% per °C
Low Temperature Start	-20°C
Humidity	5 - 95% RH non condensing
Shock	±3 x 30*g* shocks in each plane, total 18 shocks 30*g* shock = 11ms (+/-0.5msec), half sine Conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987. Conforms to MIL-STD-810E/F, Method 514.4, Pro I, Cat 1,9
Vibration	Single axis 10 - 500 Hz at 2*g* (sweep and endurance at resonance) in all 3 planes Conforms to EN60068-2-6, IEC68-2-6 Conforms to MIL-STD-810E, Method 516.5, Pro I, IV, VI
Altitude	3,000 metres operational
Pollution	Degree 2, Material group 3

SAFETY APPROVALS

	Date	Amendments		Date	Amendments
EN 60950-1	2001		EN 61010-1	2001	
UL 60950-1	2003		IEC 61010-1*	2001	
CSA 22.2 No 60950-1	2003		IEC 60601-1	1988	
IEC 60950-1*	2001		EN 60601-1	1990	A1:1991, A2:1995
CE Mark	LV Directive 72/23/EEC(EN60950-1:2001)		UL 60601-1	2001	A1:1993, A2:1995, A13:1996
** CB certificate and Report available on request*			*Check with factory for status of approvals*		

OUTLINE & CONNECTION DRAWINGS

All drawings relate to both 175W and 180W versions

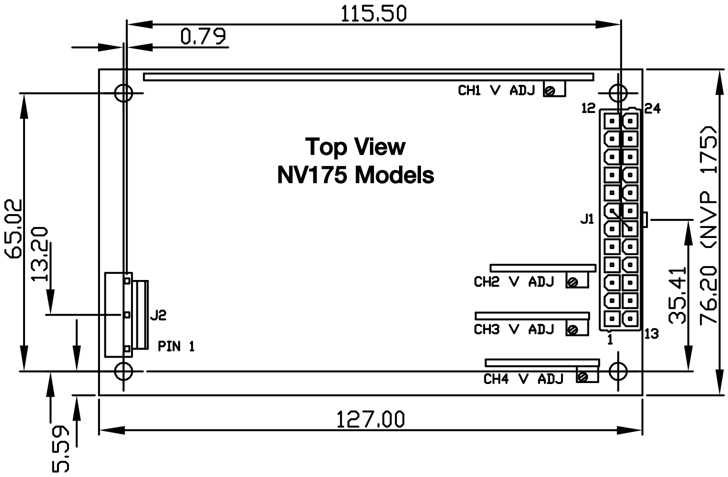


Notes
1. All customer fixings M3
2. Maximum Penetration 4.5mm
3. Maximum torque 0.9Nm
4. All tolerances +/-0.5mm

OUTLINE & CONNECTION DRAWINGS

CONTINUED

All drawings relate to both 175W and 180W versions

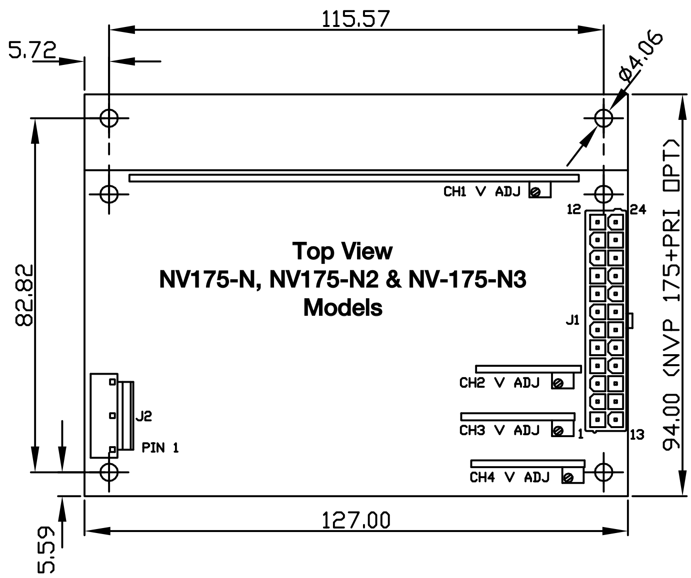


J2

PIN	FUNCTION
1	EARTH
2	NOT CONNECTED
3	LIVE
4	NOT CONNECTED
5	NEUTRAL

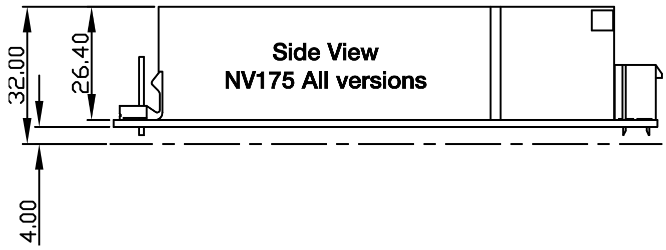
J1

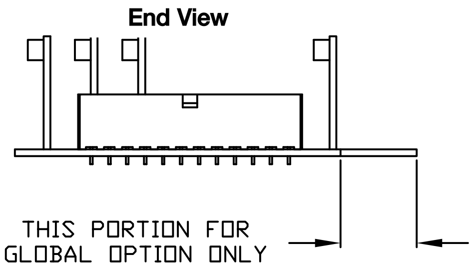
PIN	FUNCTION	PIN	FUNCTION
12	STANDBY +Ve	24	STANDBY RETURN
11	POWER GOOD	23	REMOTE ON/OFF
10	CH1 OUTPUT	22	CH1 POWER GOOD
9	CH1 OUTPUT	21	CH1 OUTPUT
8	CH1 OUTPUT	20	CH1 OUTPUT
7	+SENSE CH1	19	-SENSE CH1
6	0V COMMON	18	0V COMMON
5	0V COMMON	17	0V COMMON
4	CH2 OUTPUT	16	0V COMMON
3	CH2 OUTPUT	15	CH2 OUTPUT
2	+SENSE CH2	14	-SENSE CH2
1	CH3 OUTPUT	13	CH4 OUTPUT



MATING PARTS (MOLEX OR EQUIVALENT)

CONN	HOUSING	PINS
J1	39-01-2245	44476-3112
J2	09-50-8051	08-52-0113





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